DOCUMENT RESUME

ED 445 632 HE 033 305

AUTHOR Kennedy, Peter W.; Sheckley, Barry G.; Kehrhahn, Marijke T.

TITLE The Dynamic Nature of Student Persistence: Influence of Interactions between Student Attachment, Academic Adaptation, and Social Adaptation.

PUB DATE 2000-05-00

NOTE 21p.; Paper presented at the Annual Meeting of the Association for International Research (40th, Cincinnati, OH, May 21-24, 2000).

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS Academic Achievement; *Academic Persistence; Adjustment (to Environment); College Students; Dropout Research; Educational Research; Grade Point Average; Higher Education; School Holding Power; Scores; Self Efficacy; *Social Integration; *Student Adjustment; *Student Attrition

IDENTIFIERS *AIR Forum; Student Adaptation to College Questionnaire

ABSTRACT

This study examined what combination of students' adjustment, institutional attachment, Scholastic Assessment Test scores, high school class rank, college grade point average (GPA), adaptive style, self-efficacy, and help-seeking would discriminate persisters from nonpersisters after 1 year of college. Researchers investigated the degree of accuracy with which the assessment of factors within the first six weeks would classify students as persisters or nonpersisters, noting increases in accuracy when independent variables were assessed during the last six weeks. During the first and last six weeks of the first academic year, students completed the Student Adaptation to College Questionnaire, Help Seeking Inventory, Adaptive Style Inventory, and Academic Self-Efficacy Scale. The dependent variable (persistence or nonpersistence) was determined using student enrollment records from the following fall. Persistence related to dynamic interactions throughout the year involving students' self-evaluations. Persisters were students whose GPAs improved during the year, whose GPAs were consistent with their expectations, or who indicated they had adapted academically. Many students persisted despite contrary predictions because their successful social integration and feelings of fit with the institution compensated for academic performance inconsistent with expectations. Results highlighted a complex, dynamic relationship among multiple variables which modified feelings of attachment throughout the academic year. (Contains 27 references.) (SM)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 445 632

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
D Vura
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

The Dynamic Nature of Student Persistence: Influence of Interactions between Student Attachment, Academic Adaptation, and Social Adaptation.

Peter W. Kennedy,
Chair, Department of Medical Technology and Respiratory Care
University of Hartford 200 Bloomfield Ave, W. Hartford CT 06117 (860) 768-4823

Barry G. Sheckley
Professor and Section Head, Adult Learning Program
University of Connecticut 249 Glenbrook Road, U-64, Storrs, CT 06269 (860) 486-3813

Marijke T. Kehrhahn
Associate Professor of Adult Learning
University of Connecticut 249 Glenbrook Road, U-64, Storrs, CT 06269. (860) 486-3813

Presented at 40th Annual Forum, The Association for Institutional Research, Cincinnati, OH, May 21-24, 2000

HE033305

BEST COPY AVAILABLE

The Dynamic Nature of Student Persistence: Influence of Interactions between Student Attachment, Academic Adaptation, and Social Adaptation

Abstract

Despite decades of research, educators can explain only limited amounts of the variance associated with attrition. Attempting to explain more of this variance, this study examined several variables having promise for enriching current theoretical models of student attrition.

Results indicated that student attachment to the institution and students' perception of their academic performance were the most important variables for explaining the variance associated with attrition. Results also indicated a complex and dynamic relationship among multiple variables, which modified feelings of attachment throughout the academic year, leading to the development of a revised theoretical model of student attrition.

The Dynamic Nature of Student Persistsence: Influence of Interactions between Student Attachment, Academic Adaptations, and Social Adaptation

In the United States student enrollment in higher education is at an all time high. Projections indicate continuing increases in enrollment through the year 2008 (Geraghty, 1996). At the same time, institutions are reporting freshman attrition rates ranging from 20% to 50% (American Medical Association, 1991; Ester & Edge, 1992; Geraghty, 1996; Krotseng, 1991; Schwartz, 1990;Tinto, 1987; Wolfe, 1993). About 27% of all students do not return for their sophomore year at four year colleges (Geraghty, 1996). While researchers have attempted to identify factors related to persistence and non-persistence, research studies over the past few decades consistently explain only 20% to 30% of the total variance associated with persistence (Kohen, Nestel & Karmas, 1978; Mutter, 1992). New directions in research are needed.

Background

The integration-committment model of attrition developed by Tinto (1975) and later modified by Pascarella and Terenzini (1983) has been used repeatedly in past research. According to this model persistence is strongly related to a student's: (a) level of academic and social integration ("fit") with an institution, (b) commitment to earning a degree (goal commitment), and (c) commitment to an institution (institutional commitment). In each form, according to the model, commitment is a multifaceted variable. A student's home environment (including parental support, expectations and perceived value of higher education) is related to his/her level of goal commitment. A student's interaction with faculty and other students is related to the level of commitment he/she develops to a particular institution. Together, the level of social integration, academic integration, goal commitment, and institutional commitment are related to a student's overall persistence to complete a degree at a specific institution.

Though the student integration-committment model of persistence (Pascarella & Terenzini, 1983; Tinto, 1975) is widely used to guide research, studies using this model typically leave about 80% of the variance "unexplained" (Mutter, 1992). Two factors may contribute to this result. First, many research

studies are conducted as one-shot assessments. Longitudinal research on persistence is not common. Second, many research studies use the relatively narrow range of variables included in theoretical models without expanding the scope of inquiry to include a wider set of measures. For example, the widely used theoretical models (e.g., Tinto, 1975) posit that "integration" is linked strongly to persistence yet very few studies use specific measures to pin down the multiple dimensions of a student's "integration." Baker and Siryk (1983) used their Student Adaptation to College Questionnaire (SACQ) to demonstrate that a student's level of attachment to an institution was directly correlated with persistence. Yet this instrument is not widely used to provide reliable and valid measures of integration in multivariate analyses of persistence. A number of other variables that are related to persistence such as a student's GPA, SAT scores, adaptive style (Kolb & Wolfe, 1981), help-seeking behaviors (Karabenick & Knapp, 1991), and academic self-efficacy (Owen & Froman, 1988) are also not typically included in persistence studies.

To increase the amount of variance in persistence that can be explained by inquiry, this study gathered data at the beginning and end of an academic year to explore two research questions:

1. What combination of student's adjustment (academic, social, personal, emotional), institutional attachment, SAT scores, high school class rank, college GPA, adaptive style, self-efficacy and help seeking, discriminated persisters from non-persisters after one year of college?

2. To what degree of accuracy was the assessment of factors within the first six weeks (September/October) of the first year able to classify students as persisters or non-persisters, and what was the increase in classification accuracy when independent variables are assessed during the last six weeks (April/May) of the first year?

Methods and Procedures

Sample

The sample for this study was drawn from the entering freshman class at a private, independent, residential college in Connecticut (N = 214). Individuals within this population were matriculated, full-time, residential students between the ages of 18 and 20 years old.

The sample of 143 individuals who participated voluntarily in this study was comprised of 101 (70%) females and 42 (30%) males. Average age was 19 years old, ranging from 18 years to 20 years.

Students were primarily white, non-Hispanic (135; 94%). Other races and ethnic groups comprised only 6% of the sample. The average SAT score for all subjects was 529 (math; SD = 71), and 533 (verbal; SD = 75). Average high school class rank was the 69th percentile (SD = 18). The majority of reported family incomes were within the range of $51,000 to $80,000. In most cases, both of the student's parents completed about three years of college. These characteristics of the sample were similar to those for the entire student population with the exception of average SAT_{math} scores (which were approximately 40 points higher for the sample), SAT_{verbal} scores (which were 95 points higher for the sample) and high school class rank (which was 10% higher for the sample).

In terms of the independent variables, as indicated by the Student Adaptation to College Questionnaire (SACQ), students perceived their college in an acceptable, although not overly enthusiastic manner. Scores on the academic self-efficacy measure indicated that most students were confident in their ability to do college level work. Their average total adaptive flexibility score (M = 16.4) was consistent with scores for the general population. Measures of help-seeking indicated that in order to improve their academic performance they tended to increase their own efforts and not seek help from others.

Instruments

The Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1986) consists of 67 Likert type items. High scores on the SACQ indicate better adjustment. This instrument provided an overall total score and four subscale scores: academic adjustment, social adjustment, personal-emotional adjustment, and attachment. Research suggests that higher scores on attachment and adjustment are related to persistence.

The Help Seeking Inventory (Karabenick & Knapp, 1991) assesses student's tendencies and attitudes toward seeking assistance in terms of seeking help from formal sources (e.g., faculty) or relying on their own abilities (e.g., studying harder). The instrument also assessed the extent to which seeking help threatened student's self-esteem. The inventory contains 18 Likert type items. Research suggests that individuals will well-developed help-seeking tendencies will persist in college.

The Adaptive Style Inventory (Kolb & Wolfe, 1981), measures an individual's ability to flex their styles for grasping and transforming information in response to the "pull" of different situations. The instrument is a 48 item self-report that provides a total score that indicates an individual's overall adaptive flex. Research suggests that individuals with higher adaptive flex will persist in college.

The Academic Self-efficacy Scale (Owen & Froman, 1988) is a 28 item instrument that measures an individual's confidence in organizing and carrying out typical tasks in school. Research suggests that higher scores are related to persistence.

Data Collection

Each subject completed questionnaires during the first six weeks of the academic year (September/October). During the last six weeks of their first academic year (April/May), students were again contacted on an individual basis and sent a second set of the same questionnaires they completed in September/October. The dependent variable (persistence or non-persistence) was determined based on student enrollment records of the following fall semester.

A total of 143 students out of the total entering population completed the first phase of data collection in late September or early October (a 67% participation rate). During the late phase of data collection in April and May, only 39 students returned completed questionnaires (27% of the initial sample). As discussed later, this lower return rate may have influenced the interpretation of the results for the late assessment question.

Enrollment data were available on all students to determine whether or not they persisted and enrolled in a second year of study at the institution. Of the students who completed questionnaires in September/October 103 enrolled for their sophomore year, 34 withdrew. For the April/May group, 33 were persisters, 6 were non-persisters.

Data Analysis

Stepwise discriminant function analysis (DFA) was used to (a) predict classification of individuals as either persisters or non-persisters and (b) calculate the percentage of variance explained by each

variable included in the analysis. Variables were entered into the analysis if they had "theoretical significance" (e.g., subscale scores on the Adaptive Style Inventory did not have "theoretical significance" for this study), if a significant difference existed on the variable as as measured by a t-test, and the variable had low inter-correlations with other independent variables. For variables exhibiting high correlations with other independent variables, the variable with the highest theoretical significance was used. The reduction of sample size during the spring assessment introduced the potential for sample bias not present in the initial sample with the possibility that only highly motivated students responded, or only those students satisfied with their educational experiences could affect the outcome of the analyses. This potential bias therefore limits the interpretation of the results.

Results

Research Question 1. What combination of measures of institutional attachment, academic adjustment, social adjustment, , personal emotional adjustment, SAT scores, high school class rank, college GPA, adaptive style, academic self-efficacy and help seeking attitude, discriminate persisters from non-persisters after one year of college.

Univariate analyses of data collected during the first six weeks of the freshman year (September/October) indicated that persisters (M = .62, SD = .27) felt more attached to the institution than did non-persisters (M = .35, SD = .26) (t = 5.26, p = .001; d = 1.02). Persisters (M=2.87; SD = .64) when compared with non-persisters (M=2.47; SD = .80) also had a higher GPA (t = -2.63; p=.01; d= .93). Social adaptation to college revealed a similar pattern with persisters (M = .60, SD = .27) in comparison to non-persisters (M = .43, SD = .29) reporting a greater feeling of successful adaptation to college (t = -3.10; p = .001, d = .61). On academic adaptation persisters (M = .56; SD = .28) reported a higher level of successful adaptation than did non-persisters (M = .42; SD = .25; t = -2.67; p = .01; d = .53), a finding that mirrored the results on GPA.

There were no significant differences between persisters and non-persisters in the other measures included in the study. For this sample, there were no significant differences between persisters and non-persisters on Adaptive Flex, help-seeking, self-efficacy, and SAT scores. For this reason, these measures

were not included in the DFA.

Discriminant function analysis, using variables assessed within the first six weeks of the student's first academic year, correctly classified 80.3% of the sample and explained 29% of the variance. Among actual persisters, 88.3% (n = 91) were correctly classified, and 11.7% (n = 12) were incorrectly classified. Among non-persisters, 55.9% (n = 19) were correctly classified, and 44.1% (n = 15) were incorrectly classified. This analysis indicated that persisters could be identified quite accurately (88.3%), but that the current set of variables (institutional attachment, GPA, social adaptation, academic adaptation and SAT scores) were less accurate for classifying non-persisters (55.9%).

Three variables significantly contributed to the total explained variance. Institutional attachment explained 16% of the variance, GPA explained 7% of the variance, and SAT-verbal explained 6% of the variance, for a total explained variance of 29% ($p<.01$), a quantity consistent with prior research results. Because of the high correlation between institutional attachment and social adaptation (r = .84), an interaction term was created and entered into the DFA as the first variable. Results showed a reduced amount of explained variance (21% v 29%) and a reduced accuracy of classification (77% v 80%), justifying the separation of these two variables.

This result indicates, once again, that when used in a structural model that is essentially linear in nature, the assessment of one-to-one relationships between individual variables and persistence/ non-persistence leaves most of the variance associated with persistence unexplained. Perhaps relationships involved with decisions to persist or withdraw from college are so dynamic that they are not captured by statistical analyses such as DFA. Instead, case by case analyses may provide a better picture of the complexities involved in the decision to persist or not persist.

An examination of students who were misclassified by the DFA indicated that among misclassified subjects, 15 were predicted to persist, yet withdrew, and 12 subjects who were predicted to withdraw, in fact persisted. Table 1 outlines data for individuals who were predicted to persist but did not.

Table 1. Independent Variables of Non-Persisters Misclassified as Persisters (n=15)

Case	SACQ ACAD	SACQ SOC	SACQ ATT	SACQ P/E	SACQ TOT	GPA	SAT V	Gender
#22	.27*	.73	.79	.77	.42*	2.04*	540	M
#37	.27*	.54	.58	.16*	.31*	1.94*	510	F
#41	.96	.98	.84	.76	.95	3.47	590	F
#45	.69	.50	.42*	.21*	.50	3.5	480	F
#47	.21*	.04*	.05*	.07*	.04*	3.92	570	F
#52	.38*	.58	.27*	.27*	.27*	2.51	480	M
#82	.21*	.99	.98	.38*	.73	1.2*	410	M
#84	.38*	.79	.54	.24*	.54	2.35	480	F
#109	.76	.69	.54	.66	.73	2.68	550	M
#113	.82	.79	.69	.58	.82	2.46	600	F
#126	.54	.07*	.07*	.38*	.21*	3.23	570	F
#130	.03*	.01*	.04*	.08*	.01*	2.33	300	M
#134	.46*	.27*	.27*	.10*	.21*	2.87	540	F
#141	.54	.24*	.42*	.16*	.31*	2.93	540	F
#150	.46*	.62	.69	.31*	.54	2.53	540	F
	(.46)	(.54)*	(.66)*	(.10)*	(.34)*			

Note. *Variables which appear to be related to the subjects misclassification. () = April/May assessment scores.

Most of the 15 subjects who were misclassified as "persisters" had scores that indicated a lack of attachment or integration with the college. The results also suggest that non-persistence is related to patterns of interactions among several variables and that these patterns are unique to each individual.

For example, "Sally" (case #22) reports low academic adaptation despite her "C" average. Although Sally was not a candidate for academic probation, she may have compared her grades with students who had higher GPAs and interpreted her 2.0 average as an indication that she was not "doing well," a perception that could be reflected in her low academic adaptation score. Since several academic majors within this college require a "B" average for admission or continuation, Sally could have interpreted her "C" average as a failure to qualify for the academic major she desired. Sally's case is interesting because her dissatisfaction with academic performance appears to have negated an otherwise satisfactory adaptation ("fit") to college as represented by an above average attachment score (.79) as well as positive social (.73) and personal/ emotional adaptation (.77) scores. As noted by van Allen (1988), students similar to Sally who perceive their performance as unsatisfactory are likely to withdrawal.

"Bill" (Case # 37) had scores on social adaptation (.54) and attachment (.58) that were similar to most persisters. In contrast to most persisters, however, he achieved a low GPA and scored low on academic adaptation, personal/emotional adaptation, as well as total adaptation to college. Bill appears to have adapted socially to college but was not performing well academically and did not adapt well personally or emotionally. This overall pattern perhaps contributed to his withdrawal.

Other cases demonstrated a variety of patterns with some high scores suggesting persistence and some low scores indicating non-persistence. In most cases individuals were predicted to persist based on attachment, GPA, and SAT-verbal scores, yet poor self-evaluations on two or three other variables appears to have negated influences that favored persistence. Of the fifteen subjects misclassified as persisters, only three did not reflect a pattern of scores that helped explain their non-persistence. Cases #41, #109 and #113 all scored high on measures of adaptation to college and performed well academically, yet still withdrew. Family problems, health problems, financial constraints and a change of priorities by the individual, factors not measured in this study, could have influenced their decisions. Overall the results listed in Table 1 suggest that dynamic interactions among two or more variables may provide a better understanding of decisions related to persistence than do one-way relationships.

Among students misclassified as non-persisters yet who in fact persisted, a similar pattern of dynamic interactions is evident (Table 2).

Table 2. Independent Variables of Persisters Misclassified as Non-Persisters (n=12)

Case	SACQ ACAD	SACQ SOC	SACQ ATT	SACQ P/E	SACQ TOT	GPA	SAT V	Gender
#25	.08	.27	.18	.14	.10	2.98*	580	F
	(.18)*	(.46)*	(.38)*	(.34)*	(.31)			
#28	.50	.31	.24	.07	.21	2.48	550	F
	(.50)	(.86)*	(.58)*	(.24)*	(.58)*			
#57	.04	.76*	.31	.46	.34	1.22	520	M
#62	.07	.42	.24	.10	.08	2.17	520	M
#63	.18	.21	.16	.07	.10	2.78*	620	M
	(.01)	(.07)	(.04)	(.07)	(.01)			
#71	.46	.50	.73*	.07	.31	2.01	610	F
#79	.18	.82*	.82*	.31	.46	.91	560	F
#83	.01	.01	.05	.04	.21	1.82	400	M

#85	.24	.07	.12	.16	.08	2.88*	600	F
	(.54)*	(.16)*	(.18)	(.58)*	(.27)*			
#93	.14	.54	.27	.01	.14	.74	430	F
	(.03)	(.38)	(.50)*	(.02)	(.05)			
#96	.50	.66	.42	.34	.50	2.17	620	F
	(.50)	(.58)	(.50)*	(.31)	(.46)			
#121	.03	.12	.08	.10	.04	2.65*	530	F

Note. * Variables which appear to be related to the subjects misclassification.() = late year assessment scores.

The September/October scores of these 12 individuals indicate that they are likely to withdraw. For example, "Susan" (case #25) scored low for all areas of adaptation (including academic adaptation), in spite of achieving a good GPA. By April/May, however, Susan's scores indicated a major change; all her scores improved, some doubled. Even though her scores are below those of most persisters, the pattern of change in the direction of increasing attachment – and not the simple magnitude of her scores – appears to have contributed to her decision to remain in college. Three other cases (#28, #85, #93) reveal a similar relationship between persistence and changes over the course of a year in the direction of increased attachment and adaptation.

The data in Table 2 suggest that two or three scores associated with persistence may result in misclassification of subjects as non-persisters. For example, cases #71 and #79 both reported scores reflecting high levels of attachment (.73 and .82 respectively) in spite of poor or barely acceptable GPA achievement. For other students, good academic achievement alone appeared to be associated with persistence, a finding consistent with the literature. Overall these results again suggest that a single score that represents a static point in time cannot explain persistence because persistence is influenced by dynamic interactions that can occur over the course of a full year. Since relationships among variables related to persistence are complex, a more dynamic model is required to depict accurately the processes involved in a student's decision to persist or withdraw.

Research Question 2. To what degree of accuracy was the assessment of factors within the first six weeks (September/October) of the first year able to classify students as persisters or non-persisters, and what was the increase in classification accuracy when independent variables are assessed during the last six weeks (April/May) of the first year?

Only 39 of the 143 participants returned questionnaires at the end of the semester, a factor that

may limit the interpretability of the results. This group was similar to the September sample in that students were primarily white, non-Hispanic (97%), female (82%), from households earning over $51,000/year (65%) and having parents who either completed some college or graduated from college (73%). As a result of the reduced sample size during the April/May assessment session (n = 39) only five independent variables were used in the DFA: institutional attachment, GPA, SAT-verbal, social adaptation, and academic adaptation. In the analysis of the September sample, persisters and non-persisters differed on these five variables. The stepwise DFA for the April/May sample correctly classified 89.7% of the cases, an improvement over the 80.3% rate for the September/October sample. Explained variance however, remained essentially the same ($31\%_{\text{April/ May sample}}$ versus $29\%_{\text{September/October sample}}$) again indicating that just examining individual variables without assessing interactions with other variables and dynamic changes over time is a limited approach to explaining the variance associated with persistence.

Institutional attachment (21% of the variance) and academic adaptation (10% of the variance) were the most significant variables in this analysis. Interestingly, "academic adaptation" emerged in this analysis in place of GPA, a factor found significant in the September/October sample. These results are in line with the argument stated by Pascarella and Terenzini (1991) that "academic adaptation" is broad indicator that includes an individual's self-perception of intellectual development. For this reason numbers such as GPA may not fully represent the dynamics involved in academic adaptation and decisions to persist.

Only four subjects were misclassified during the late assessment. A post hoc analysis of these individual cases again revealed dynamic patterns. In the two cases misclassified as non-persisters (case #85, case #135) both students performed well academically (GPA of 2.8 and 2.5 respectively) and reported institutional attachment and academic adjustment that doubled over the year. These changes over the course of the year appear to have counteracted initial perceptions of poor institutional attachment. In contrast, both individuals misclassified as persisters reported decreased levels of adaptation over the year perhaps related to achieving GPAs that were lower than expected or needed for entry into the major of

their choice. As before, these results suggest that decisions to persist or not persist are related to dynamic interactions and are not due to the linear, one-to-one paths depicted in many models of persistence.

Discussion

The results suggest that persistence is related to dynamic interactions that occur over the course of an academic year and that involve students' self-evaluations. For example, in line with prior research (Tinto, 1975), persisters were students whose GPA improved over the course of a year, whose GPA was consistent with their expectations, or who indicated that they had adapted academically. Similar to the complexities discussed by Pascarella and Terenzini (1991), a number of students in this study persisted despite predictions to the contrary because their successful social integration and feelings of "fit" with the institution seemed to compensate for academic performance that was not consistent with expectations. These results provide encouragement for administrators, student-affairs personnel, and faculty to remain actively involved with freshman over the course of a year and continually attempt to engage new students in experiences that contribute to students' positive self-perceptions and feelings of successful adaptation to college.

Feedback

The results also suggest that theoretical models of student persistence should highlight the role of feedback in helping students to adapt to college. Although research consistently highlights that feedback can explain up to 40% of the variance in learning (Lysakowski & Walberg, 1982) other researchers (Kluger & DeNisi, 1996) suggest that feedback must be delivered carefully to achieve maximum effect. As outlined in Figure 1, feedback is most effective when it is provided continuously, offered in a timely manner, and given with specific references to concrete tasks. With such feedback students can compare and adjust their internal expectations and goals to calibrate their academic performance. Since first year students are influenced by external feedback related to academic performance (as seen in this study), first year courses that provide frequent, specific feedback, and integrate that feedback into scenarios of

successful academic adaptation can have a powerful influence on decisions to persist or withdraw (Pascarella & Terenzini, 1976; 1977).

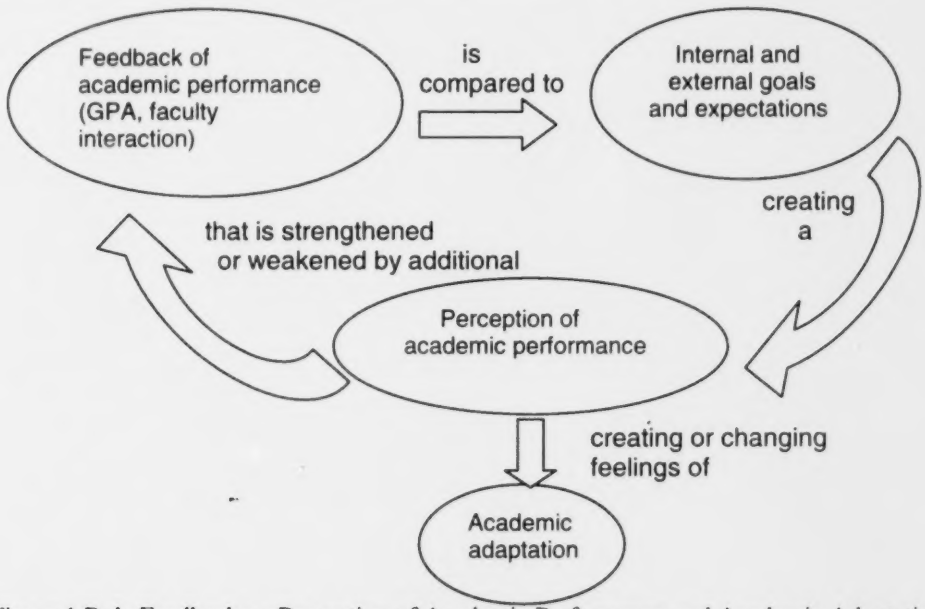
Feedback of academic performance (GPA, faculty interaction)
is compared to
Internal and external goals and expectations
creating a
that is strengthened or weakened by additional
Perception of academic performance
creating or changing feelings of
Academic adaptation

Figure 1 Role Feedback on Perception of Academic Performance and Academic Adaptation

The two scenarios that follow reflect important differences in how feedback given in college courses can have a positive or negative impact on perceptions of academic adaptation and, possibly, eventual decisions to persist or withdraw.

1. Professor Thomas hands Sally her written assignment with the letter "C" boldly written in red ink on the first page. No other comments are provided. Sally leaves disturbed. Since she never received a "C" before in her life she wonders if this means she cannot succeed in college.

2. Prior to handing back her assignment, Professor Smith explains to Tom that the first written assignment in a freshman course is designed as an opportunity for students to adjust to the standards of college writing. For this reason Professor Smith warns Tom that he will see many comments and edits throughout the paper. These, Professor Smith advises, are suggestions for ways Tom can improve his writing. Tom is initially taken back with the red "C" on the first page. He reflects on Professor Smith's comments and as he reads the comments and suggestions written in the margins he regains confidence that he can improve his writing and be successful in college.

In the first scenario Sally has little or no information to use in calibrating the feedback. Without recourse she reverts to the standards she used in high school, a decision that leaves her full of self-doubt. In

contrast, Professor Smith provides Tom with information that helps Tom interpret his professor's feedback. With this information Tom reframes a grade he could interpret as "subpar" into a larger, more optimistic framework. If these scenarios typify Sally's and Tom's experiences over the year, any inclinations Sally had of withdrawing may be exacerbated while any such feelings Tom had could be counteracted by a steady diet of well-constructed feedback from the likes of Professor Smith.

Dynamic Interactions

The follow-up analyses of cases that were misclassified by the DFA highlight a number of complex interactions relating to persistence that are not evident in a linear analysis. For example, in some cases students' evaluation of their academic performance as "good" compensated for poor institutional attachment and vice versa. Additionally, as reflected in the changes identified between the early and late assessment periods, students' perceptions of adaptation and performance often changed from the beginning to the end of the first year. These changes in perception, in turn, altered decisions to persist or withdraw, as seen in the cases of students who were misclassified. These results indicate that the relationships among variables are ever changing, and ever evolving. Casti (1994) characterized the interactions within such a system as a "dynamical process."

According to Casti (1994), static, uni-dimensional, or lineal models do not reflect constant changes in variables. In a dynamical process a small amount in one part of a system can amplify as the change travels through the system and result in large changes. Ed Lorenz, a meteorologist from MIT, labeled this phenomenon the "butterfly effect" to indicate that a butterfly flapping its wings in Tokyo today could set off wind currents that result in a major storm impacting San Francisco next week. Second, according to Casti (1994), dynamic models consist of hard to understand linkages (interactions) among the variables, linkages that are lost when a dynamic process is broken into smaller pieces for analysis.

Both characteristics of dynamic systems help to explain the results of this study. For example, relatively small changes in reported scores of academic adaptation, social adaptation or institutional attachment had major implications. Specifically, in cases were individuals were misclassified as persisters

or non-persisters, an analysis of small changes in variables (e.g., an increase in academic adaptation score over the year) was associated with decisions to persist. The linear analyses conducted within the DFA were not sensitive enough to record the impact of these subtle, yet dynamic changes on decisions to persist. Second, attempts to quantify relationships using unidimensional variables provide little information on how an individual student interprets or values a particular variable. According to Casti (1994), measures of variables such as those included in a model of persistence (e.g., GPA) do not reflect the value a person places on that variable. Predictions that are made solely on numbers do not include the complex interactions that occur as a result of the values students place on each of those measures. For example, the analysis in this study indicated that students with similar GPAs made different decisions to persist or withdraw perhaps because they each valued the importance of GPA differently. This pattern also applies to the other variables included in this study because measures of students' values were not used to "weight" indicators of social adjustment, emotional adjustment, or institutional attachment.

A final point made by Casti (1994) is that dynamical systems are time dependent. Accordingly, relationships that exist among variables as well as their value to the whole model change over time. Related to the attrition process, a student may develop a strong interest in a certain subject and/or an attachment to a particular faculty member. Such emerging interests and evolving relationships can result in an increased desire to do well academically. For this reason one-time predictions at the point of entry into college would not reflect these dynamic changes and therefore would likely be inaccurate.

The results of this study suggest that factors involved in a student's decision to persist interact as variables within a dynamic system (Casti, 1994). As such, they may never be reduced to a static, unidimensional model.

The dynamic nature the interactions involved in persistence, however, offers a ray of hope and optimism for educators who are grappling with ways to improve rates of persistence. In a dynamic system any small, almost imperceptible change may ultimately result in significant changes during an academic year or over several academic years. For this reason, educators should be encouraged to interact with

students continuously with the promise that constant experiences that provide students with evidence that they are adapting and adjusting successfully to college will enhance the likelihood of their persisting.

As outlined in Figure 2 (next page) these interactions can take many different forms. Administrators must not approach this task with a "one-solution-fits-all" philosophy. As indicated in this study, students enter college with a wide array of goals, expectations, abilities, and styles that interact in complex ways with the institutional culture as well as academic or social experiences provided by the college. In turn, these interactions provide feedback to students that help to calibrate their feelings of academic performance and adaptation to the college. These feelings and self-evaluations provide a basis for making decisions to persist or not persist. As indicated in Figure 2, the more often college educators can provide experiences and feedback that help students to cultivate accurate self-evaluations regarding their social and academic adjustment to the college, the more influence educators will have on sustaining persistence at the college.

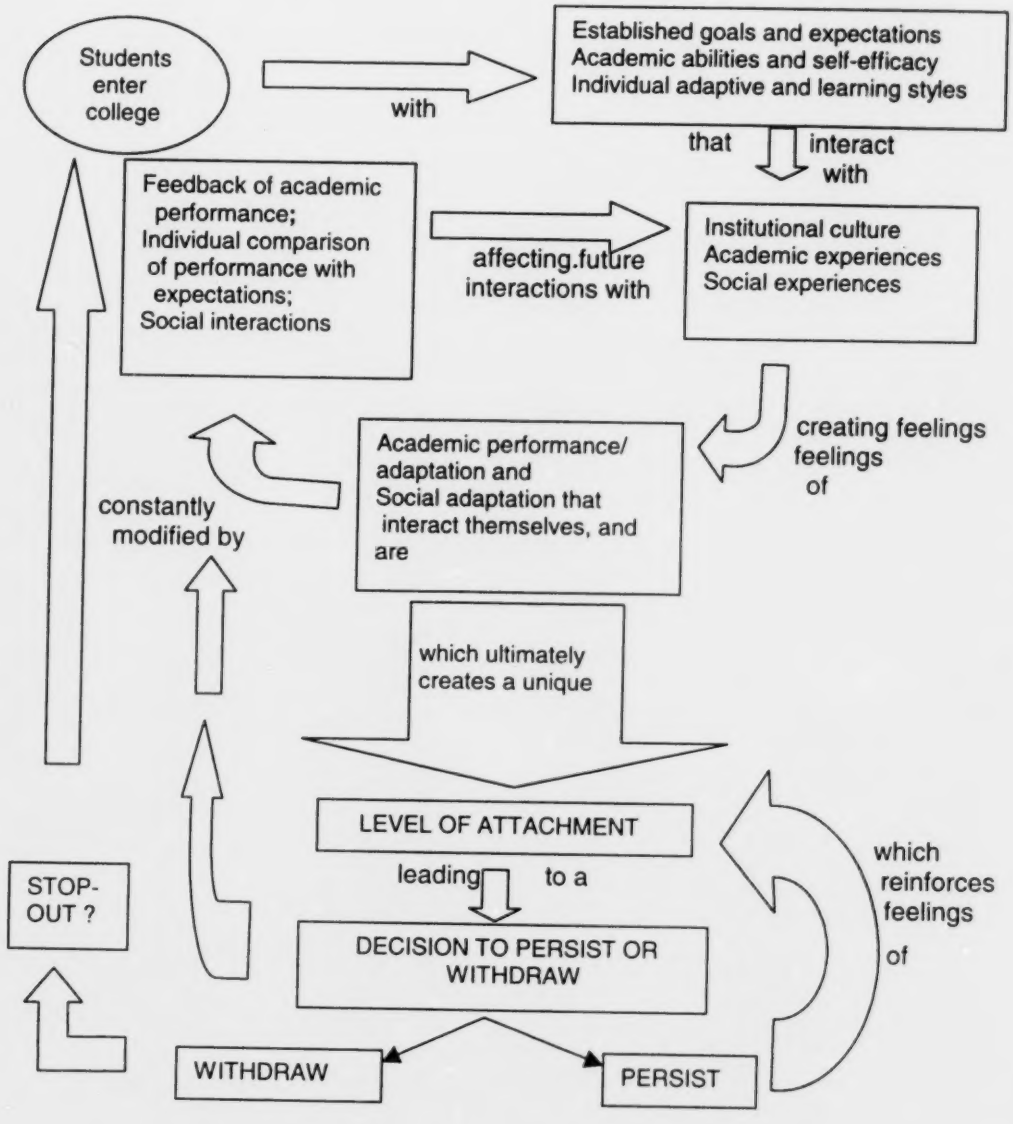

Figure 2 Dynamic System Process of Persistence Decision Making

References

American Medical Association, Division of Health Education and Accreditation. (1991). Allied Health Education Newsletter, **22**(5).

Baker, R., & Siryk, B. (1983). "Social propensity and college adjustment." Journal of College Student Personnel, **24**: 331-336.

Baker, R., & Siryk, B. (1986). "Exploratory intervention with a scale measuring adjustment to college." Journal of Counseling Psychology, **33**(1): 31-38.

Baker, R., & Siryk, B. (1989). Student Adaptation to College Questionnaire. Los Angeles, Western Psychological Services.

Casti, J. (1994). Complexification: Explaining a paradoxical world through the science of surprise. New York: Harper Collins.

Cohen, J. (1992). "A power primer." Psychological Bulletin, **112**: 155-159.

Ester, J., & Edge, R. (1992). "Early identification and intervention: the key to retention." Presented at the American Association for Respiratory Care Summer Forum, Vail, CO.

Geraghty, M. (1996). "More students quitting college before sophomore year, data show." Chronical of Higher Education, **42**(45): A 35.

Karabenick, S., & Knapp, J. (1991). "Relationship of academic help seeking to the use of learning strategies and other instrumental achievement behavior in college students." Journal of Educational Psychology, **83**(2): 221-230.

Kluger, A. N. & DeNisi, A. (1996). "The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory." Psychological Bulletin **119**(2): 254-284.

Kohen, A., Nestel, G., & Karmas, G. (1978). "Factors affecting individual persistence rates in undergraduate college programs." American Educational Research Journal, Spring, 233-252.

Kolb, D. & Wolfe. (1981). Professional education and career development: A cross sectional study of adaptive competency in experiential learning. (NIE Grant #NIE G 77-0053)(ERIC Document Reproduction Service No. ED 209 493 CE 030 579).

Krotseng, M. (1991). "Predicting persistence from the Student Adaptation to College Questionnaire." Paper presented at the Association for Institutional Research Annual Forum, San Francisco, CA.

Lent, R., Brown, S., & Larkin, K. (1986). "Self-efficacy in predictions of academic performance and perceived career options." Journal of Counseling Psychology, **33**(3): 265-269.

LeWallen, W. (1993). "The impact of being "undecided" on college student persistence." Journal of College Student Development, **34**: 103-112.

Lysakowski, R. S. & Walberg, H. (1982). "Instructional effects of cues, participation, and corrective feedback: A quantitative synthesis." American Educational Research Journal **19**(4): 559-578.

Mutter, P. (1992). "Tinto's theory of departure and community college student persistence." Journal of College Student Development, **33**: 310-317.

Owen, S., & Froman, R. (1988). "Development of a college academic self-efficacy scale." Paper presented at the National Council of Measurement in Education. New Orleans, LA.

Pascarella, E., & Terenzini, P. (1976). "Informal interaction with faculty and freshmen ratings of academic and non-academic experience of college." Journal of Educational Research, **70**: 35-41.

Pascarella, E., & Terenzini, P. (1977). "Patterns of student-faculty informal interaction beyond the classroom and voluntary freshman attrition." Journal of Higher Education, **48**: 540-552.

Pascarella, E., & Terenzini, P. (1983). "Predicting voluntary freshman year persistence/withdrawal behavior in a residential university: a path analytic validation of Tinto's model." Journal of Educational Psychology, **75**(2): 215-226.

Pascarella, E., & Terenzini, P. (1991). How college affects students. San Francisco CA: Jossey-Bass.

Ryland, E., Riordan, R., & Brack, G. (1994). "Selected characteristics of high-risk students and their enrollment persistence." Journal of College Student Development, **35**: 54-58.

Schwartz, S. (1990). A study on student persistence-attrition in Minnesota Technical Institutes. St. Paul, MN: State Board of Technical Colleges.

Tinto, V. (1975). "Dropout from higher education: a theoretical synthesis of recent research." Review of Educational Research, **45**: 89-125.

Tinto, V. (1987). Leaving college. Chicago: The University of Chicago Press.

Wolfe, J. (1993). "Institutional integration, academic success, and persistence of first year commuter and residential students." Journal of College Student Development, **34**: 321-326.